

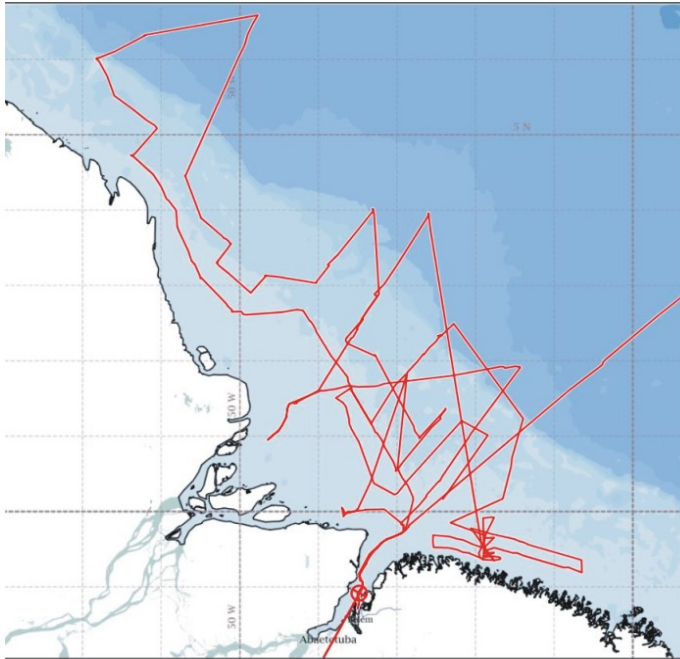


FS Meteor Cruise M147
Las Palmas, Canary Islands
– Belém, Brazil
Weekly Report 14.05.2018-
20.05.2018



Our SSE-NW profile along the 20 m depth contour line, with continuous salinity and CO₂ recording, a of total 14 CTD stations with parallel pump and fish sampling of the surface layer and some multicorer stations, led us up into the EEZ of French Guiana, where we took a turn to follow the eastward extension of the Amazon plume. While the freshwater plume flows northward in a rather small strip along the coast up to about 5°N, from here it widens notably and reaches further into the Atlantic. On our northeastern-most station at 6°35'N 51°12'W we had transparent blue water for the first time, with a salinity of more than 35, which was a clear indication that we had left the freshwater plume behind us and that we had the pure seawater endmember of the Atlantic under the keel for the first time in two weeks. Here, we also carried out an intercalibration station of the GEOTRACES program, close to a point where earlier the different water masses were sampled and analysed within the framework of the GEOTRACES program. Our renewed sampling allows a comparison of the data at different times and from the different institutions.

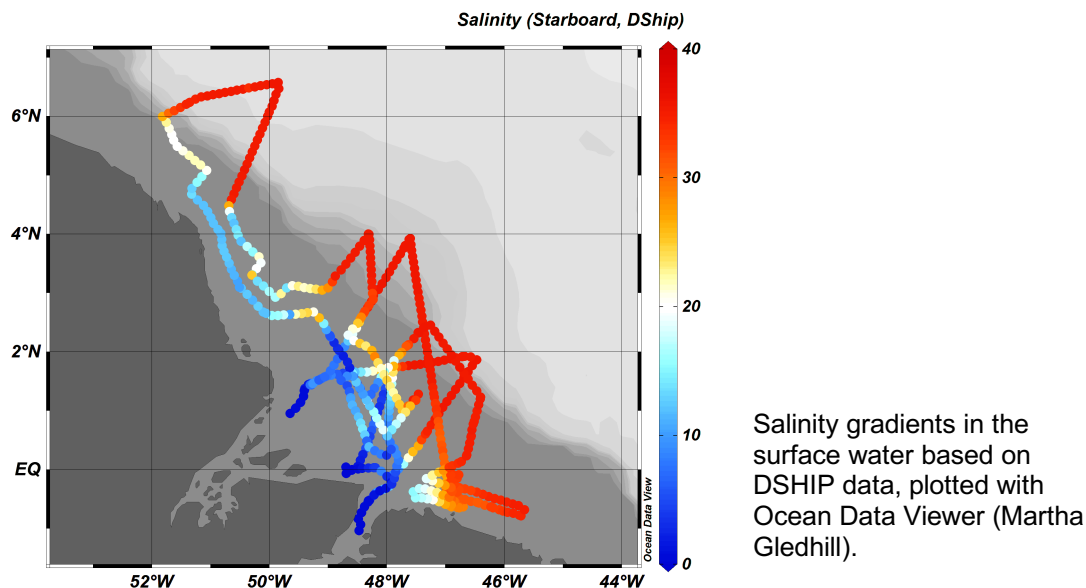
Since in this region we were north of the intertropical convergence zone ITCZ, and had stable dry weather conditions, we were able to use the evening of 14th May for a felicitous barbecue party on deck. Freshly boosted, we were able to start our transect back from NW to SE, moving about 30 nautical miles east of the previous transect. The sampling program was similarly structured to the previous one and was only interrupted to cover missing stations and salinity points of the Amazon outflow transects along the NW-directed salinity gradient into the Atlantic. The significant impact of the tidal currents on the exact position and distribution of the mixing zones required a repeated adaptation of the station plans to the local conditions. Again, the occasionally very intense fishing activities with boats and nets impacted our straight-line profiles. The last days were used to close further gaps in the sampling net and to finish all profiles.



Total profile and sampling track of cruise M147, during which 74 Standard CTD-rosette samplers, 15 trace-metal clean rosettes, 10 single GoFlo-bottles, 60 pumps for radium samples, 107 surface samples with the towed fish and 22 multicorers were carried out as stations.

Since we had not achieved approval for bathymetric surveys from the Brazilian navy, the echosounder had to remain switched off along the route within the EEZ of Brazil.

At the end of the journey, we have covered all river and seawater endmembers and the whole mixing zone between the EEZ of French Guiana at 6°N and 1°S in the mangrove groundwater discharge area southeast of the Rio Pará, according to the original plan. The somewhat erratic-looking track course is the result of the continuous adaptation of the station plan to the local conditions and the time frames required to process the high number of samples between the stations.



Salinity gradients in the surface water based on DSHIP data, plotted with Ocean Data Viewer (Martha Gledhill).

Based on the salinity data, we now already have a good overview of the spread of the freshwater outflow and its impact on biological and biogeochemical processes within the region, which can be assessed based on the nutrient data (nitrate, phosphate, silicate) produced onboard. The first evaluation of the radium isotope data gives hints about the

influence of the ground water discharges of the mangrove belt on the composition of the water masses and the temporal frame of the water mass movement to the northwest.

All members of the programme agree that the M147 cruise was very successful and all working groups achieved their goals, despite occasionally challenging working conditions. The atmosphere was very pleasant throughout the cruise and the excellent support of the science team from the ship's leadership under captain Rainer Hammacher and his crew were a significant element of the success of this cruise. Once again, we would like to express our gratitude to all!



The science and ship's crews send a last salute from cruise M147! As can be seen on the photo, after heavy rainfalls at the beginning of the cruise we noticed that the rainy season is now coming to an end and we were occasionally able to enjoy the sun and the southern cross.

Andrea Koschinsky

FS Meteor, 20.05.2018